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ABSTRACT

This paper discusses information literacy skills and procedures for breaking information resources into their component data. The paper draws on the work of two Australian committees to establish the importance of these skills and briefly describes a research project on library services required to support the delivery of competency-based training curriculum. Structures and strategies for breaking information into component parts and recombining those parts are identified, and a list of information competencies developed by Michael Marland is included. The concluding section suggests that librarians and teachers should work together to provide students with materials and activities that will enable them to develop information skills. Four charts that can be used for information retrieval are appended. (KRN)

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INFORMATION LITERACY: THE KEYSTONE OF THE BRIDGE

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The mastery of the skills gathered under the label of information literacy is seen as crucial to the success of the student in successfully completing their studies. Mastery of information literacy is a crucial supporting factor in the establishment of lifelong learning. This paper discusses how information is used and procedures for breaking information resources into their component data. Both theoretical and practical aspects will be explored.

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INTRODUCTION

This paper explores the use of information resources. As the title of the presentation suggests, it is my belief that solid mastery of information literacy skills is the keystone to the bridge to success. With mastery, the bridge to success will be available for the *traveller* to cross.

THE FINITE BRAIN

As with all containers, the human brain has finite bounds. It is unrealistic to expect that a person can store, within their convoluted nervous substance, all the information that they have gathered and will gather during their life. There is simply not enough room!

A limited amount of information, such as seat numbers at the theatre, is retained in short term memory for immediate use. Some information, for example the car registration number, may be used frequently over a considerable length of time and thus be committed to long term memory. Other information may not be even memorised - it will be identified and recorded. The brain will recall where to look for that information, for example, the information stored in a desk telephone directory.

These bounds are set on retention of information. What I suggest is crucial is that people can store, and recall, processes that will enable them to define, identify and retrieve information.

The memorisation of these processes should have priority over the storage of information. My argument is that application of the process should always lead to the retrieval of the required information. As such boundaries are widened or eliminated. The brain is used not as a simple storage device but as a sophisticated information processing tool.

So much for limits of the mind. What other information supports the need for mastery of information literacy skills?

FROM THE COMMITTEES

The Finn Committee identified *accessing and using information* as a component of the key area of competence - *Language and Communication.* (Australian Education Council Review Committee 1991 (Chairperson T.B. Finn))

The Mayer Committee considered the work of the Finn Committee and developed a set of key competency strands. These key competency strands, they suggest, *are essential for effective participation in work and other social settings. They focus on the capacity to apply knowledge and skills in an integrated way in work situations.* (The Mayer Committee 1992, p.8)

Two key competency strands proposed by the Mayer Committee are:

- Collecting, analysing and organising ideas and information.
- Expressing ideas and information.

With regard the former, the Committee (The Mayer Committee 1992) clearly expresses the viewpoint that these skills will relate to each of six Finn key areas. These are:

- language and communication
- using mathematics
- scientific and technological understanding
- cultural understanding
- problem solving
- personal and interpersonal.

For a clear picture of the interplay between the work of the Finn and Mayer Committees, readers are referred to the grid chart on p 10 of the Mayer Committee's Report (1992).

FROM THE FIELD

During the first part of the year, Anne Floyd (now Senior College Librarian at Mt Gravatt College of TAFE) and I conducted an extensive research project on library services required to support the delivery of a competency-based training curriculum. *(Copies of our report have been sent to all TAFE♦TEQ college directors and libraries.)* As part of that research we looked at how the implementation of this form of curriculum would effect teaching styles.

Participants at our workshops suggested quite a few impacts - 301 in fact. Several themes were evident.

- individualised instructional methods will be frequently used
- where the instruction is self-paced and individualised, reliance is placed on the student having a reasonable level of literacy and mastery of research (information processing) skills
- teaching resources will become learning resources
- teachers will use a wider range of techniques and strategies
- whole class lessons will not be as frequently used as they have been
- students will have greater responsibility in the management of their own learning.

In summary, students will not be taught, they will learn through undertaking a structured sequence of activities. Teachers will be managers and facilitators of learning. They will rely on students being able to complete assignments and activities largely with minimal supervision.

INFORMATION LITERACY?

This paper identifies information literacy as the keystone to success. What is information literacy?

> *To be information literate, a person must be able to recognise when information is needed and have the ability to locate, evaluate and use effectively the needed information. . . . Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organised, how to find information, and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning, because they can always find the information needed for any task or decision at hand.* (American Library Association Presidential Committee on Information Literacy 1988)

INFORMATION?

Basically . . .

So far I have addressed the rationale supporting the development of information literacy and defined information literacy. I turn now to deal with the substance of information.

The nature of *information* has intrigued me for some time. It has only in the past year or so that I have become comfortable with a concept, a model of information and how we expect it to be used.

I start with a basic flow.

Data is a disorganised mass of ideas and concepts. We are surrounded, even buried, by data. Some of this data shares a relationship. It may be data about an event, thing, place or person. A grouping of data based on the identified relationship is made. With this group of related data, a coherency or logical organisation is imposed. For example data about a place could be organised as climate, geography, people, customs and tourist features. Within the organisation further groupings may be made. As a result we have a collection of data that has a universal relationship, has been logically organised and is coherent.

At this stage the data becomes an information resource. Thus, a definition of an information resource is *An information resource is a set of data sharing at least one universal relationship that has been logically structured into a coherent form.*

When the data has been formed into an information resource, it is most easily able to be used within an educative process. The result of the process is the development of knowledge. Thus, knowledge, in these terms, will be based on the use of information resources in an educational setting.

Development of knowledge is not exclusively based on the above. Knowledge can be developed through personal experience. It is interesting to note that knowledge developed though personal experience can be transmitted in two ways.

Firstly, the personal experience may be duplicated. Alternatively, the data of the experience may be recorded as information and used, as suggested above, to develop another's knowledge.

In further depth . . .

The preceding paragraph provides a clue to how information resources are used. When a student selects an information resource, for example a book or video, is it expected that they will use all the information provided . . . or is there an element of selection involved? Usually the resource is selected so that some sort of question can be answered.

Based on the three stages described above a more complex model of use can be developed.

The entry point is where the information need is defined. Based upon this definition, information resources are located. The student examines the information resource and decomposes it into the data groupings and then into the elements of data in each grouping.

A selection of data relevant to the need is made. These steps may be repeated using different information resources.

The student then has a selection of data that is relevant to the defined information need. When the student feels that enough data have been selected, (hopefully) it is organised into a logical, coherent mass. That mass becomes a new information resource that has been developed from preexisting resources. The universal relationship is that this data should meet a defined information need.

The information resource is then used by the student and teacher to develop that student's body of knowledge.

The previous section of the paper deals with flow. To make sure that the flow is of suitable volume and quality, strategies need to be considered. This paper considers two.

STRUCTURES and STRATEGIES

Decomposition

All information resources have structure. If they did not, they would have little use. They would be incapable of being understood, they would lack coherency.

If the information user can identify the structure, decomposition of the information resource becomes relatively easy.

The structures that are most commonly used in TAFE are:

- listing
- problem/solution
- question/answer
- cause/effect
- comparisons.

Each of these structures can be identified through a variety of keys.

Examples are:

Listing

Look for phrases such as:

- There are several types of . . .
- Some features of this model are . . .
- First we observed . . . then . . .
- The sequence of events was

Problem/Solution and Question/Answer

These phrases are often used:

- The solution to . . . was . . .
- . . . solved . . .
- The trouble was caused by . . .
- We need to . . . so that

Cause/Effect

Look for:

- . . . may be due to . . .
- If . . . then . . .
- As a result of . . . the following happened . . .

Comparison

Phrases to be on the alert for are:

- in contrast
- on the other hand
- similar to
- compared with.

Appended to this paper are four charts. They can be used for decomposition of information into data while retaining the organisational structure.

Recomposition

Just as all prepared information resources have structure, so too should the information resources developed by the student. The same structures, as described above, can be used by students to:

- analyse the intent of a question and thereby establish the information need
- organise the collection of data, and
- provide a logical shape to the information resource being developed.

There are clues the student should be alert for that will show the structure to be developed.
The following phrases and question stems will be commonly found.

Listing

- What are
- Show the steps
- Describe in order

Problem/Solution and Question/Answer

- Analyse
- Discuss
- If

Cause/Effect

- What was the outcome
- Outline the causes of
- What effect

Comparisons

- Discuss the advantages and disadvantages of
- Show the difference
- How effective

The appended charts will also be able to be used for this, the recomposition of data into information.

COMPETENCIES TO BE ACHIEVED

This paper has covered a range of concepts from the nature of information to strategies for decomposition and recomposition. In these competency-based times, what competencies does the student need to have to be a competent user of information.

Based on the work of Michael Marland (1981), the following competencies should be achieved.

The student is able to:

- formulate and analyse the information need
- identify and appraise the worth of likely sources
- trace and locate individual resources
- examine, select and reject individual resources in the light of the information need
- interrogate resources to isolate required information
- record and store information
- interpret, analyse, synthesise and evaluate the information gathered
- present and communicate findings
- evaluate the conduct of the process.

CONCLUSION

In conclusion, What are we aiming for? I suggest that we need to ensure that each student:

- is aware of the range of information resources available through a wide variety of information providers;
- has a sound grounding in research process methods;
- has a sound knowledge of how information and information resources are organised; and
- is a confident, competent user of information resources.

Who is responsible for assisting students to master these competencies and achieve these aims? I suggest that library and teaching staff should work together to present students with materials and activities that will develop their skills. These activities should be presented 'in-context' so that relationship between the process and a beneficial outcome can be seen.

Ultimately, we need to ensure that all students master information literacy skills and that this area be accepted as both a core competency and an essential learning. If not, then the words of Gamaliel Bradford will ring uncomfortably true.

> *Ignorance is the curse of the age we live in. We talk about the dark ages. When was there one so dark as this? We have smothered ourselves, buried ourselves, in a vast heap of information which all of us have and none of has.* (Bradford G. 1991)

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COMPARATIVE INFORMATION RETRIEVAL

Look for these words in the text: ☐ although ☐ compared with ☐ despite ☐ different from ☐ even so ☐ however ☐ in contrast ☐ instead ☐ like ☐ meanwhile ☐ on the other hand ☐ similar to

Look for these words in questions and assignment topics: ☐ Access the importance/value ☐ Advantages/disadvantages ☐ Compare ☐ Evaluate ☐ How effective ☐ Show the difference ☐ To what extent/degree ☐ What similarities ☐ What contrast ☐ What difference is there

This chart has been set up for three way comparisons. Where more than three cases are being examined, extra sheets should be used.

COMPARISON POINT	CASE 1:	CASE 2:	CASE 3:

CAUSE/EFFECT INFORMATION RETRIEVAL

Look for these words in the text: ☐ although ☐ and may be due to ☐ as ☐ at first ☐ because ☐ before/after ☐ cause ☐ effect ☐ eventually ☐ finally ☐ if...then ☐ result ☐ since ☐ so ☐ when

Look for these words in questions and assignment topics: ☐ Analyse ☐ Discuss ☐ Evaluate ☐ Explain ☐ Explain ☐ Give reasons ☐ Give an account ☐ Outline the causes of ☐ Suggest ☐ What was the outcome ☐ What effect ☐ What event occurred ... which cause ... led to

CAUSE	EFFECT/S

LISTING INFORMATION RETRIEVAL

Look for these words in the text: ☐ all ☐ also ☐ as time passed ☐ characteristics ☐ first ... then ☐ first ☐ for example ☐ for instance ☐ later ☐ lots of ☐ many parts ☐ next ☐ sequence ☐ several ☐ some features ☐ such as ☐ to begin with ☐ types

Look for these words in questions and assignment topics: ☐ Arrange ☐ Describe in order ☐ Detail ☐ List ☐ What are ☐ Show the steps

TOPIC:

CONCEPT:	**CONCEPT:**
IDEAS/POINTS: ☛ ☛ ☛ ☛	**IDEAS/POINTS:** ☛ ☛ ☛ ☛

CONCEPT:	**CONCEPT:**
IDEAS/POINTS: ☛ ☛ ☛ ☛	**IDEAS/POINTS:** ☛ ☛ ☛ ☛

PROBLEM/SOLUTION and QUESTION/ANSWER INFORMATION RETRIEVAL

Look for these words in the text: ☐ adaptions ☐ because ☐ difficulties ☐ need to prevent ☐ option of ☐ problem ☐ question/answer ☐ result ☐ so ☐ solution ☐ solved ☐ trouble

Look for these words in questions and assignment topics: ☐ Analyse ☐ Discuss ☐ If

PROBLEM or QUESTION	SOLUTION or ANSWER